

**CELTICECIS (DIPTERA: CECIDOMYIIDAE), A NEW GENUS FOR
GALL MAKERS ON HACKBERRIES, *CELTIS* SPP. (ULMACEAE)**

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Abstract.—A new genus, *Celticecis*, is described for ten species of Cecidomyiidae (Diptera) that cause various leaf and twig galls on hackberries, *Celtis* spp. (Ulmaceae) and which were formerly placed in catch-all genera. The type-species of *Cecidomyiaceltis* is shown to belong to the Agromyzidae (Diptera), so the name is unavailable for these gall midges. Ten new combinations are proposed, and a lectotype for *Mayetiola celtiphyllia* Felt is selected.

Ten described species of North American gall midges form spinelike, spherical, or cylindrical galls on leaves and twigs of hackberries, *Celtis* spp. (Ulmaceae). These cecidomyiids are monophyletic but have been placed in catch-all genera. Species known from adults were placed in *Mayetiola* (also known as *Phytophaga* in Felt (1915, 1940)) or *Cecidomyia* but in fact have only distant connections with those genera. Five species known only from galls were originally placed in *Cecidomyiaceltis* but were listed as unplaced Cecidomyiidae by Foote (1965). A new genus is described for these species to characterize them as a discrete group and to separate them from *Mayetiola* in the broad sense.

Cecidomyiaceltis was described by Patton (1897) in partial demonstration of a method for naming galls whose makers were unknown. He formed the name by combining the generic names of the insect (in this case *Cecidomyia* in the broad sense) and plant. Patton chose as type-species of *Cecidomyiaceltis*, *C. deserta*, n. sp., named for long, hollow swellings of young twigs (see Felt 1940, fig. 189) of *Celtis occidentalis* L. in Orange, Conn. Patton wrote that single "cecidomyian flies" emerged about the first of June from a perforation near the base of the gall. Whether he saw a cecidomyiid fly, or more properly a larva, emerge is unknown. Although that name and others were based only on galls, the *International Code of Zoological Nomenclature* (1964) accepts as valid those names proposed before 1931 if based either on the work of an animal or a bibliographic reference to such. Patton (1897) also named and included in *Cecidomyiaceltis* five species on the basis of complicated leaf and twig galls from Texas described earlier without names by Riley (1890): *Cecidomyiaceltis oviformis*, *C. semenrumicis*, *C. pubescens*, *C. capsularis*, and *C. spiniformis*. Riley's gall material is in the USNM and contains gall midge larvae generically similar to those of species reared and described by Felt and Beutenmüller from other hackberry leaf galls. These larvae are so distinctive that one can confidently assume that adults reared from Patton's species will fit quite well in *Celticecis* as defined here. Whether *Cecidomyiaceltis*

was an unavailable name for the complicated leaf and stem gall makers, as well as for the simple stem swelling, depended on what produces the latter.

Wells (1916), in a paper on the morphology of various hackberry galls, showed photographs and drawings of *Cecidomyiaceltis deserta* swellings on *Celtis occidentalis* from Kansas. He thought that the gall could be formed by a lepidopteran but never made a definite connection between any lepidopteran and the gall. I recently discovered that the gall is actually formed by an agromyzid (Diptera). During the second week of April, 1982, in the Washington, D.C., area, I noticed the galls developing on lateral shoots of *C. occidentalis*. Normal shoots lengthened to 10–15 cm or more in about two weeks, but galled shoots remained only 1–4 cm long and swelled considerably. The terminal pair of leaves on galled shoots, the probable entry point of the maggot, soon died and turned brown, but the twig and lateral leaves remained green for several weeks. The agromyzid maggot, one in each gall, fed towards the base of the twig. When the maggots were full grown in the first week in May, they cut a circular hole at the base of the swollen twig, crawled out, and dropped to the duff. Puparia I placed in a rearing chamber were killed by nematodes. The name *Cecidomyiaceltis deserta* refers to that agromyzid, the true gallmaker, and not to a cecidomyiid.

The new genus, *Celticecis*, is in the same large tribe, the Oligotrophini, as *Mayetiola*, but the two are readily separable. In the key to cecidomyiid genera in Gagné (1981), the species on *Celtis* are already separated from *Mayetiola* spp. in the strict sense because the latter have toothed instead of simple claws. In addition to that difference, *Celticecis* spp. have a greatly reduced complement of larval papillae, do not form a puparium, and the adult abdominal sternites are broader than long. In Gagné (1981) the new genus keys to couplet 182 as *Mayetiola*, s.l., where it is combined with three species affecting willow buds. A couplet 182a to differentiate between the hackberry and willow midges of erstwhile *Mayetiola*, s.l., is as follows:

- 182a. Caudal row of setae on tergites 2–6 continuous; empodia as long as tarsal claws; from leaf galls on *Celtis*; 10 spp. *Celticecis*, new genus [The 5 spp. in unplaced Cecidomyiidae in Foote (1965) were unaccounted for in Gagné (1981).]
 - Caudal row of setae on tergites 2–6 interrupted mesally; empodia appreciably longer than tarsal claws; from bud galls on *Salix*; 3 spp. *Mayetiola* Kieffer (sensu lato)

***Celticecis* Gagné, NEW GENUS**

Adults.—Eyes large, broadly joined at vertex, the facets closely approximated except laterally. Male flagellomeres 14–21, necks shorter than nodes. Female flagellomeres 14–25, with very short necks. Labellae hemispherical, setose. Palpus 4-segmented, segment 2 widest, 4 longest, all with many setae.

Mesonotum with 4 longitudinal setal rows without scales between. Anepisternum scaled dorsally, anepimeron with setae, no scales. Wing with R₅ straight, joining C at or slightly anterior of wing apex. Claws simple, narrow, curved beyond midlength. Empodia about as long as claws. Pulvilli about 1/3 as long as claws.

Tergites 1–7 in male and 1–6 in female rectangular, much wider than long, with basal pair of widely separated, long trichoid sensilla (length ca. 5× width of socket,

continuous caudal rows of setae, no lateral setae except on tergites 6–7 of male, 6 of female, and covered elsewhere with scales. Male tergite 8 shorter than preceding tergites, sclerotized only basally but with caudolateral and lateral setae, 2 trichoid sensilla, and scattered, sparse scales. Female tergite 7 almost square, with 2 trichoid sensilla, several rows caudal setae, and scattered scales on caudal $\frac{1}{2}$; tergite 8 much longer than wide, entire or divided longitudinally depending on length of ovipositor, with pair of basal trichoid sensilla and scattered short setae caudally, bare elsewhere.

Sternites 2–8 in male, 2–6 in female rectangular, wider than long, with basal pair of closely approximated, long trichoid sensilla, caudal rows of setae and a band of setae, more numerous laterally, across midlength, scattered setae elsewhere. Sternite 7 of female longer than wide, otherwise as for preceding sternites, sternite 8 unsclerotized, with only basal pair of trichoid sensilla. Pleura covered with scales.

Ovipositor long, the distal $\frac{1}{2}$ at least several times as long as tergite 7. Cerci fused, subspherical to elongate. Male genitalia: gonopod long, setose on full length ventrally, distal $\frac{2}{3}$ dorsally; gonostylus tapering from wide base to pointed apex, setulose at least basally, striate at least apicodorsally; hypoproct divided caudally, the lobes narrow, parallel sided; aedeagus and claspettes shorter than gonopods; gonocoxal apodeme broad.

Pupa.—Antennal horns not prominent. Pronotal setae and prothoracic spiracles long. Clypeus with 4 papillae in center of sclerite, the 2 uppermost setose. Abdomen dorsally and ventrally uniformly setulose except bare in intersegmental areas.

Larva (last instar).—Robust, stout. Integument pebbled throughout. Spatula broad, developed only cephalically, with 1–3 triangular points cephalad. Lateral papillae reduced to 2 on each side of spatula, the more mesal one with a short seta. Abdominal segments 1–7 each with 2 anterior ventral papillae, 8th segment without ventral papillae; otherwise with basic pattern of papillae. Terminal segment with 4 papillae, 2 per side, each with seta of uniform length.

Type-species.—*Celticecis celtiphyllia* (Felt).

Remarks.—The name *Celticecis* means “Celtis gall.” It is of feminine gender. Species included in *Celticecis* (all are **NEW COMBINATIONS**) are:

C. capsularis (Patton) 1897: 248 (*Cecidomyiaceltis*).

C. celtiphyllia (Felt) 1908: 371 (*Mayetiola*). A lectotype is designated here because Felt’s type-series evidently contains 2 species, and I have designated *celtiphyllia* as type-species. **LECTOTYPE**, ♂, Keokuk, Iowa, emerged V-1900, J. M. Schaffer, C913, USNM Type No. 29325. Paralectotypes, 5 ♂, same data as lectotype, and 3 ♂, Corpus Christi, Texas, 1895, E. A. Schwarz, C918, all in the National Museum of Natural History, Washington, D.C. (USNM).

C. oviformis (Patton) 1897: 248 (*Cecidomyiaceltis*).

C. painteri (Felt) 1935: 7 (*Phytophaga*).

C. pubescens (Patton) 1897: 248 (*Cecidomyiaceltis*).

C. semenrumicis (Patton) 1897: 248 (*Cecidomyiaceltis*).

C. spiniformis (Patton) 1897: 248 (*Cecidomyiaceltis*).

C. texana (Felt) 1935: 8 (*Phytophaga*).

C. unguicula (Beutenmüller) 1907: 388 (*Cecidomyia*).

C. wellsii (Felt) 1916: 190 (*Phytophaga*).

Galls made by *Celticecis* spp. form on new plant growth in spring and soon attain their distinctive and maximum size and shape. When the larvae are full grown in summer, they spin a cocoon within the gall. The galls drop from the leaves some time before normal leaf fall. Adults emerge the following spring. Details on the biology of various species can be found in Felt (1915, 1916), Painter (1935), and especially Moser (1954, 1965). Moser (1965) wrote that more than one species was possibly involved in one kind of gall. He tentatively considered *C. unguicula* (Beutenmüller) a junior synonym of *C. spiniformis* (Patton) because of the galls' similarity, but I am considering the two as separate species here (as they were in Foote, 1965) because of the larval differences Moser noted. The type-series of *C. celtiphyllia* is itself a mixture of two species, one from Iowa, the other from Texas. It is clear that a taxonomic study of the genus will depend on good collections across geographical and host ranges. Fewer species of *Celtis* occur in the United States than south of the U.S.-Mexican border. Moser (1954) presents a complete list. Moser (1965) found "*C. spiniformis*-type" galls on *C. occidentalis*, *C. laevigata* Willd. and "*C. reticulata* Torr." in the United States and on *C. siniensis* Pers. from Honshu, Japan. Yukawa (1976, 1982) has reported on that and another, slightly different, gall from Japan, but the cecidomyiids have not yet been described. No cecidomyiid galls have been found to date on European *Celtis* spp.

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